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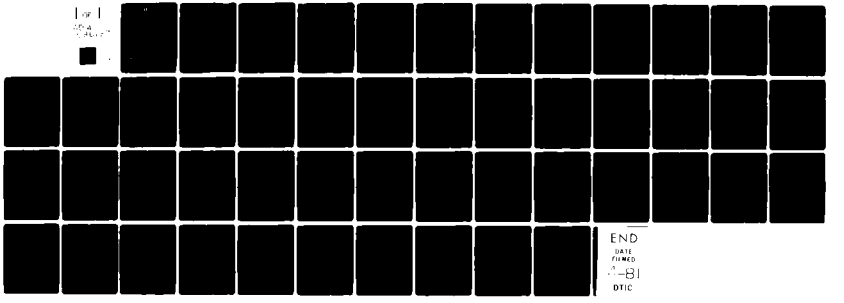

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LOSSES TO WORKERS DISPLACED BY PLANT CLOSURE OR LAYOFF: A SURVEY OF THE LITERATURE

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CENTER FOR NAVAL ANALYSES
1401 Wilson Boulevard
Arlington, Virginia 22209

By: Arlene Holen

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LOSSES TO WORKERS DISPLACED BY PLANT CLOSURE OR LAYOFF: A SURVEY OF THE LITERATURE

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INTRODUCTION

Workers who are displaced when a plant closes, or when there is a permanent layoff resulting from reduced demand, usually suffer losses in earnings. These losses are due to unemployment and to wage reductions which reflect more permanent impairment of earnings capacity.*

It is important to know the long term effects of job displacement. Many prospective changes in government policy can result in reductions in demand for specific products and lead to some job displacement. For example, if tariffs on products such as shoes or textiles are removed, the lower prices and increased imports may benefit the economy as a whole, but at the expense of the producers of these goods. Firms in these industries may suffer losses because increased import competition will result in a fall in domestic production and workers will lose because lower production will mean fewer jobs.

Many studies of displacement losses have been done in recent years and, as better data bases are developed, more studies will be done in the future. It is important that research designs take earlier work fully into account, both to avoid unnecessary duplication and to provide meaningful findings. Earlier work can provide a useful guide in choosing data bases, modeling, and selecting and measuring key variables affecting earnings losses; new studies can avoid errors that were made in the past.

This paper reviews seventeen recent studies of the effects of job loss on earnings.** They range from case studies of specific plant closures to more broadly based studies of the effects of job loss, in which control groups are used to estimate losses in earnings over a number of years after layoff. Methods of analysis range from simple tabulations to estimation of income determination models based on human capital theory.

The losses documented in these studies can be taken to illustrate the magnitude of losses that would result from displacements due to increased import penetration. Some of the studies deal with job losses specifically due to increased import competition, but all are concerned with job losses following declines in demand for domestic production. Whatever the cause of a fall in demand for the products of an industry, increased import penetration, changes in tastes, etc., the skills of workers that are specifically adapted to either the industry or to particular firms within that industry become less valuable. Thus, workers displaced in such cases may undergo a more difficult readjustment process.

*In addition, displaced workers may be more subject to physical illness and to psychological stress. Although these additional displacement costs may be substantial, they are extremely difficult to measure and are not explicitly considered in this survey.

**These studies were done between 1955 and 1975. One is a literature review of earlier work. Detailed summaries are presented below.

The aim of this paper is to facilitate the use of previous displacement studies for both policy and research purposes. Major findings on earnings losses and unemployment are summarized and compared. Special emphasis is given to describing how labor market factors, previous employment trends, and worker characteristics affect losses. Evidence is evaluated about the usefulness of early warnings, the use of natural attrition, transfer options, relocation assistance and Trade Adjustment Assistance compensation. Efforts are made throughout the paper to extract broad guidance for future studies from the strengths and weaknesses of these earlier efforts.

Concept of Loss

There is little discussion in these studies of the concept of earnings loss used, or what would in principle constitute a useful definition of earnings loss. Ideally, the measure of loss should be the difference between observed earnings and what earnings would have been in the absence of the condition which brought about the particular loss.

In practice, there are several ways of defining and measuring what earnings would have been, and each of these definitions implies an alternative control group with which the loss group should be compared. Many of the studies reviewed here failed to explicitly identify a control group. In some, the earnings of the loss group were compared with earnings before the loss. In others, earnings comparisons were made among groups of individuals within the loss group. Neither of these approaches is generally as enlightening as selecting a group of individuals who are similar to the loss group in essential identifiable ways. The simple before-after comparison fails to take into account many important factors, beside the loss event, which affect the earnings of individuals over time. These omitted factors include economic growth, cyclical changes, changes in expected labor force participation, and changes in earnings associated with age. Similarly, comparisons within the loss group do not yield overall loss magnitudes.

Control or comparison groups can be selected in a variety of ways, leading to alternative concepts of earnings loss when their experiences are compared with the experiences of the loss group. For example, one could use "typical American workers" as controls. Such a comparison would indicate losses of displaced workers relative to average workers who have average wage and layoff expectations. Alternatively, one could use as the control group, workers within the same industry who did not lose their jobs. This comparison would have the advantage of greater underlying similarities between the two groups of workers, but it would indicate losses relative to the expectation of no layoff risk. Also, this comparison would indicate losses relative to actual industry wage levels, which might also have been affected by the same market factors underlying the loss event in question. No single control group choice is necessarily the correct one, but in order to assess estimates of earnings loss, one must know what comparisons are actually being made.

FINDINGS ON EARNINGS LOSSES

The papers reviewed here analyze the results of job loss in a variety of ways. Only five of the studies measure losses in earnings directly, and even among these the methods of calculation vary. * The other studies do not measure earnings losses. Instead they use indicators such as unemployment, wage reductions, and incidence of reemployment. The differences in methodologies used are so extreme that detailed comparisons between studies cannot be made. Nevertheless, some consistent impressions do emerge and are described after separate discussion of the studies making direct earnings measurement.

Studies Comparing Direct Measures

Of the five studies that measure earnings directly, only one, the steel study [6] computes losses by comparing displaced workers to a control group of workers who were not displaced. The other four studies calculate losses by comparing pre-layoff to post-layoff earnings.

Steel Study

Jacobson uses Social Security earnings data in this study [6] to compare workers displaced from the steel industry with those who remained in the industry at the time of displacement. Additional earnings losses due to decreased demand for steel are estimated for workers who were not displaced. This is done by comparing the earnings of workers who remained in firms with falling employment to those in firms with rising employment. Displacement losses are calculated only for workers who left the industry, and therefore represent the effects of losing both firm and industry-specific skills. Since there is little labor transfer between steel firms, however, the explicit distinction may not be important.

Jacobson estimates displacement losses among steelworkers to be about $1,000 in the calendar year of displacement and to have a present value of $9,500 in 1970 dollars over the worker's lifetime. Annual losses (not discounted) due to displacement are found to be persistent but to diminish over time. Losses in the second five years following displacement come to about 50% of the first five years' loss. Jacobson finds that most of the earnings loss during the initial period is due to unemployment. About half of the lifetime loss is estimated to be due to unemployment and half to lower wages. Most of the loss calculated is relative to the rising earnings of steel workers who remain employed. ** After a year or two, earnings of displaced workers regain

*Fishman, Allen, Bunger, and Eaton [3], Jacobson [6], Pursell, Schriver and Bowlby [13], Stern [15], and Tolles [17].

**If the calculation was made in the more typical fashion, comparing earnings before and after displacement, the loss would be less than one fourth of Jacobson's estimate.

their pre-displacement level and continue to rise, slowly approaching the earnings of non-displaced workers. First year losses for workers not displaced, but affected by demand reductions, are estimated to be about $300.

The pattern of earnings recovery over time is analyzed only in the steel study, as are earnings losses over the lifetime of displaced workers. Studies relying on survey data are generally precluded from long-term follow-up. The surveys used in the studies reviewed were conducted within a few years of displacement.

Defense Worker Study

The study prepared for the Arms Control and Disarmament Agency [3], ACDA, uses survey data in a study of defense workers displaced from three plants between 1963 and 1965 by defense procurement cutbacks. By comparing levels of pre-layoff earnings to post-layoff earnings, this study estimates losses to be about half a year's salary, mostly due to zero earnings during unemployment.* In this study, salary reductions for reemployed workers were found to be relatively small.

Meatpacking Plant Study

Stern's study [15]of the losses of workers displaced from an Armour plant in Kansas City also relies on a before-after comparison using Social Security data to measure earnings. The study estimates that in the fourth year after displacement annual earnings were twenty percent below the pre-layoff level. An attempt is made to control for other factors by comparing the earnings of displaced workers as a group to the wages of all production workers in manufacturing in the metropolitan area. Since the displaced workers were not generally representative in terms of age, skill level, or other characteristics, however, valid conclusions cannot be drawn from the comparison.

Carpet Mill Study

Tolles' study [17]of displaced carpet mill workers in a small community uses survey data to make before and after comparisons, but makes no attempt to construct a comparison group. His comparisons among subgroups of displaced workers finds that women, older workers, and those with less education lose relatively more in earnings and suffer relatively more increased unemployment than do other groups.

*Labor force withdrawal is not clearly distinguished from unemployment in this study.

Electronics Plant Study

Pursell, Shriver, and Bowlby's study [13] of workers displaced when a large RCA plant closed uses a survey of displaced workers, Social Security data, and a "control group" of Unemployment Insurance applicants to study the effects of impacted worker assistance on unemployment duration and earning loss. The study concludes that workers receiving Trade Adjustment Assistance benefits adjusted less satisfactorily than workers not receiving benefits.

Unfortunately, the model is improperly specified and the control group is different from the displaced workers in many crucial respects, besides receipt of adjustment assistance. For example, 20% of the "controls" expected to be recalled by their prior employer. Also, most had much more extensive labor market experience than the displaced workers, and their skills were more marketable. The questionable results of this study emphasize the importance of carefully choosing control groups.

Other Studies

The other studies reviewed made no attempt to measure earnings losses directly but focused on unemployment duration, labor force withdrawal, and wage level reductions.* The fact that they do not measure earnings directly does not dispense with the control group problem, however. In many of these studies, loss measures are calculated in a way which merely compares post-layoff experiences among workers with selected characteristics, without regard to their pre-layoff experiences.

Although most of these studies do not provide technically sound estimates of earnings losses, which would be suitable for systematic comparison, they do contain useful information about the kinds of experiences faced by displaced workers. In some cases, consistent patterns in findings can be identified.

To illustrate, in Dorsey's study [2] of 3000 workers who were displaced when Mack Truck closed a plant in 1966, 23% were still unemployed 10 months later, and wages fell about 33% for those reemployed. In McCarthy's study [9] of shoe manufacturing workers in Massachusetts who were displaced because of import competition, 20% were still unemployed after a year. Among those reemployed, most had reduced wage rates.

Labor force withdrawal rates range widely across studies but they tend to cluster at 10%. Females and older workers withdraw much more frequently. Several studies do not clearly distinguish unemployment from labor force withdrawal [3, 11, 14].

*These measures could not be used to calculate earnings, since they are not independent.

Unemployment rates also vary widely, but tend to cluster around 20%. The average time span between layoff and survey is close to a year. Although the median duration of unemployment following layoff tends to be short (it is under 10 weeks, for example, in the Miernyk study [10] of displaced textile workers), a number of studies [1, 9, 13, 14, 17] report substantial numbers with extremely long durations, up to and exceeding a year.

Reemployed workers usually suffer some reduction in wages, but most studies reporting the distribution of wage changes find at least 10% with wage gains [1, 4, 7, 8, 9, 10, 12, 17]. Since wage changes can reflect loss of seniority as well as discontinued use of specific training, larger wage losses tended to be reported for workers displaced from plants where unions protect seniority. Wage increases for some displaced workers do not necessarily suggest that displacement was a fortunate event for them. They may demonstrate the typical variability in economic outcomes around expected values. Wage increases for some workers also occur because labor market information is not perfect, and because job mobility is perceived to be costly. In many situations, where workers know they could be earning higher wages, they still refrain from changing jobs because of the economic and psychic adjustment costs involved.

Factors Affecting Losses

In addition to measuring losses, all of the displacement studies reviewed here try to identify important factors associated with variation in these losses, such as previous trends in employment, labor market differences, and differences between individual workers. The last of these will be discussed in the next section.

Employment Trends

Jacobson [6] finds that recent employment trends within the steel industry strongly affect the number of workers with displacement losses. His analysis shows that a given employment decline will lead to more workers being displaced if age and tenure are high, since rates of natural attrition are much lower among older and more tenured workers. Age and tenure of employees when employment reduction takes place, however, depends on previous employment trends; rapid growth in employment leads to a younger and less tenured work force. Jacobson finds that earnings losses due to a 3% employment decline would be 65% higher if incurred after a period of decreasing employment rather than after a period of increasing or stable employment.

Size and Strength of Labor Market

Labor market strength and size are acknowledged to be important determinants of earnings loss in many of the studies under review, and are explicitly analyzed in

three of them. Jacobson [6] finds that a one-and-a-half percent increase in the unemployment rate leads to an increase of over $300 in the first year losses. He also finds that larger labor markets are associated with smaller displacement costs: losses are about $100 less in the first year for every increase of 700,000 in labor market size. Dorsey's study of Mack workers [2] finds that high geographic concentration of impacted workers increases unemployment duration. Concentration here is defined as the percent of the local labor force that had worked in the closed plant. McCarthy [9] assesses the effect of both unemployment rates and changes in unemployment rates on measures of displacement loss in the shoe industry, finding that both poor and weakening labor markets increase unemployment duration and reduce reemployment wages.

Effects of Personal Characteristics on Losses

The studies cited above show that, as expected, displacement losses are greater in weak labor markets. The factors most commonly found to affect losses in these studies, however, are personal characteristics -- age, sex, schooling, skill, and tenure -- and the similarity of findings on how different groups of displaced workers fare in the labor market is striking.

Direction of Effects

Nearly all the studies agree that larger losses are suffered by displaced workers who are older, female, more tenured, less educated, and less skilled. This consistency emerges despite the substantial differences in methods of analysis, data sources, and indicators of loss used. Labor force withdrawal rates are also associated with these characteristics, but similar patterns are found where the analysis is restricted to labor force participants.

A notable exception to this pattern is Jacobson's finding that younger workers have greater initial losses than prime age workers. Jacobson estimates earnings loss by comparing displaced workers to a control group of workers who are not displaced; thus the sharply rising earnings profile for younger workers in the industry is taken into account in his work. Jacobson also finds that older workers have lower lifetime displacement costs. Although older workers may remain unemployed longer than younger workers, their lifetime losses are smaller because they have fewer remaining years in the labor force.

Problems of Comparability

Because of this striking similarity among study findings on the directions of effect of worker characteristics on losses, we looked to see whether the magnitudes of effects could also be compared. Even among studies using regression analysis,

however, estimated loss differences across groups of workers are not quantitatively comparable. Lack of systematic comparability arises due to differences in the dependent variable, differences in specification and functional forms of the model, and in variable measurement. Some of these studies also failed to report their complete findings. Each of these difficulties can be illustrated by particular cases.

The problem of different dependent variables in comparing effects of personal characteristics is highlighted by comparing the ACDA study [3] with others. Most studies analyzing unemployment duration use the number of weeks unemployed in a given period after layoff. In the ACDA study, workers who had been laid off were surveyed at one time, although layoffs did not occur at the same time. Thus, the period after layoff varied across workers, confounding the measurement of weeks of unemployment in a fixed period. While several regressions in the ACDA study define the dependent variable as weeks unemployed as a percentage of weeks between layoff and survey, the results are not exactly comparable with other studies.

The difficulty of comparing findings on relative losses between workers when results are derived by using different and sometimes questionable functional forms is illustrated by the Stern [15], Pursell, Shriver and Bowlby [13]; and McCarthy [9] studies. A common problem in these studies is the inclusion of endogenously determined variables as independent variables in a single equation regression model. In the RCA study [13], for example, the number of weeks of unemployment benefits collected is used as an independent explainer of employment status in the years after layoff. Since the number of benefit weeks is determined simultaneously with reemployment, the results are difficult to interpret.

The Stern study uses transfer (to another plant within the firm) as an independent variable explaining earnings. Transfer has a strong impact on earnings, which may bias the other coefficients. Similarly, the McCarthy study uses simultaneously determined variables, such as industry of current job, as explanatory, biasing the effect of other variables.

Differences in definitions of variables also make it difficult to compare relative losses. For example, the McCarthy [9], ACDA [3], and Dorsey [2] studies all use different measures of education. Another example of measurement differences is found in estimates of the effect of sex on the magnitude of loss. In some studies this effect is captured by a single dummy variable, but Dorsey uses six sex-family status categories.

The failure to report complete findings is illustrated by Palen and Fahey's study of Studebaker workers [11]. They report beta weights rather than the regression coefficients, without enough additional information to enable comparison of their findings on the effects of personal characteristics on losses with those from other studies using regression techniques.

Size of Effects

Although the quantitative effects of worker characteristics on losses are not comparable between studies in a systematic manner, it is informative to review several regression estimates of the magnitude of relative losses. In the examples presented, losses are measured by earnings, months of unemployment, and wage changes. Differences in losses are substantial.

Consider first Stern's findings for displaced Armour workers. His multiple regression of post-shutdown annual earnings (excluding those who withdraw from the labor market) yields an earnings loss of $50 for each additional year of age, $1700 for female status, $134 for each year less of education, $1554 for unskilled status as opposed to skilled, and $16 for each additional year of tenure.

Dorsey's multiple regression explaining months of unemployment for displaced Mack workers [2] illustrates the magnitude of the effect of personal characteristics on that measure of loss. He finds, for example, an increase of .15 months of unemployment with each additional year of age, that married females experience almost 3 more months of unemployment than do single males, that the duration of unemployment is a month and a half shorter for each single increase in education class, and that, other things equal, unskilled workers have over two months more unemployment than professional workers.

Similarly high estimates are obtained for the effects of personal characteristics on reemployment wage changes. For example, the multiple regression in the study of defense workers (ACDA study [3] Republic sample) shows that weekly wages of females fall about $14 relative to wages of males, that weekly losses increase at the rate of $2 per each year of age and that there is a $13 per week gain with each increased education level. In this study skill is not entered as a separate variable.

Similar Patterns in Studies of Unemployment Compensation

Older, female, more tenured, less skilled, and less educated workers are found to have a much harder time adjusting to plant closure. Several recent studies of the economic effects of unemployment compensation find a similar pattern in results.* In these studies too, female status, age, and less education are associated with longer unemployment durations and lower subsequent earnings.

*Papers on unemployment compensation and job search by Kathleen P. Classen and Arlene Holen, "Symposium on the Economics of Unemployment Insurance," Industrial and Labor Relations Review, forthcoming; Ronald G. Ehrenberg and Ronald L. Oaxaca, "Unemployment Insurance, Duration of Unemployment, and Subsequent Wage Gains," American Economic Review, forthcoming; see also James R. Hosek, "Unemployment Patterns Among Individuals," Rand, August 1975.

This similarity in the findings of displacement and unemployment compensation studies might be expected since the determinants of unemployment duration and earnings loss are likely to be independent of the reason for layoff. The inclusion of temporary as well as permanent layoffs in the unemployment insurance studies does not alter the directions of effect found for personal characteristics.

Explanation of Effects

Several of these findings common to displacement and unemployment compensation studies can be easily explained. Higher initial losses for female workers, for example, can be attributed to employer preferences in hiring (whether because of discrimination or because of differences in turnover costs or in productivity) or to differences in labor supply. For the same reasons and because they lose both more specific skills and the advantages associated with seniority on the job, older workers may be expected to incur greater annual displacement losses than younger workers.

It is more difficult to explain why less educated and less skilled workers are both unemployed longer and lose more earnings following displacement. One possible explanation for their longer unemployment is that these groups have lower opportunity costs of being out of work and therefore have a greater incentive in the shortrun to remain unemployed longer. This explanation, however, does not account for the evidence of persistent reduced wages and earnings. Stern [15] finds, for example, that these workers have not "recovered" relative to others even four years after displacement.

An alternative explanation which can conceivably account for greater subsequent as well as greater initial losses for these groups, is that human capital includes an ability to adjust to change as well as job or industry specific skills.* Among workers losing their jobs because of plant closure, permanent layoff, or generally unanticipated reductions in demand, those best able to adapt may be those with more human capital. The human capital measures, such as education, and skill, may incorporate native as

*Theodore W. Shultz, "The Value of the Ability to Deal with Disequilibria," The Journal of Economic Literature, September 1975, Vol. XIII, Number 3.

well as acquired abilities.* This ability to adjust among the more educated and highly skilled may in fact dominate the opposite effect expected on a priori grounds of greater earnings reductions due to greater losses of specific skills among higher skilled workers.

REDUCTION AND COMPENSATION OF LOSSES

It may be possible to reduce or compensate the costs of transition following reduced demand for labor in a number of ways. Employers in some cases may rely on attrition to reduce employment, rather than laying workers off. Adjustment problems can be mitigated by earlier warning, which allows for job search before layoffs, by transfer options in the case of multiplant firms, by direct assistance in job search and relocation, or by retraining programs. In addition, adjustment costs are compensated by Trade Adjustment Assistance, Unemployment Insurance, supplemental unemployment benefits, severance pay, and early retirement plans.

Attrition

Voluntary separations reduce employment and the need for imposing layoffs in order to achieve targeted employment reductions. This process is documented in one of the Bureau of Labor Statistics' Case Studies of Displaced Workers [1]. Displacement losses in one case study were minimized by spreading reductions over three years, enabling half of all separations to be achieved through natural attrition. Early retirement incentives were also important in this case. Potential displacements amounting to one-sixth of the total reductions were avoided in this way.

Jacobson's study of the steel industry [6] finds attrition rates to be much greater for recently hired workers. His results suggest that fewer workers need to be displaced during employment reductions when relatively more of them are newly hired. Employment declines of a given size would thus lead to less displacement cost during periods of cyclical expansion.

*The change in earnings following displacement may also be related to education and skill because of transitory fluctuations in earnings. A smaller loss (or larger gain) for a more highly educated worker may mean that he was underpaid before being displaced. The hypothesized positive relationship between skill, education and adaptability is supported by evidence given on pre-shutdown job search and transfer.

If previous earnings are not held constant, positive coefficients for personal characteristics such as education and skill can be interpreted as reflecting either superior ability in work or in adaptability following layoff. With previous earnings (worker productivity) held constant, the coefficient should represent superior adaptability to a disequilibrium labor market situation.

Early Warning

Four studies investigate the impact of advance notice of impending layoffs, but do not find clear indications of its value. Although McCarthy [9] finds that advance notice reduced the number of weeks of unemployment benefits drawn, his results for total unemployment duration are not significant. Lipsky's study of General Foods [8] finds that few workers searched for new jobs prior to layoff despite two to three years' warning time. Both the Foltman [4] and Portis and Suys [12] studies find that white collar workers take greater advantage of the notice period than blue collar workers. Many workers make no prior search effort during the period of advance notice.

Transfer

Evidence on the value of transfer options suggests that workers who move to other plants within a firm have higher earnings but that many workers are reluctant to move. Stern [15] finds that transfer increases annual earnings by $2600 but Lipsky [8] finds that despite many encouragements to transfer, less than 25% of the group he studied took advantage of the opportunity. Moreover, Lipsky points out that workers choosing transfer are more likely to have characteristics associated with higher future earnings.* Other studies show retention of job security to be an important inducement to transfer.

Retraining

There is little useful evidence in these studies on the value of worker retraining or job search assistance. The fact that many displaced workers were reemployed within the same industry, however, suggests that the potential of retraining programs may be limited.

McCarthy's study of the severely impacted shoe industry in Massachusetts finds that 65% of workers who found subsequent employment were reemployed within the industry. These had less unemployment and better wages than workers who changed industry. Miernyk [10], also, finds that although textile employment was declining substantially in New England, displaced textile workers in that region managed to find more jobs in their old industry than in any other. Opportunities thus appear to exist for retaining industry specific skills even when industries are sharply declining.

*These findings on the association between early job search and skills and transfer and skill are also consistent with Shultz' view that general problem solving and adaptive abilities are acquired through education and training.

Compensation

The degree to which displacement costs were offset by various forms of compensation varies widely in the studies reviewed. Jacobson [6] estimates that displaced steel workers over 55 would be likely to recoup their losses through regular pensions and early retirement pay. Steel workers under 40 with over two years tenure would have about 30% of their losses compensated by unemployment insurance and supplemental unemployment benefits. McCarthy [9] finds that the Trade Adjustment Assistance program was generally ineffective in compensating displacement losses. He recommends that lump sum compensation, based on years with the company, replace benefits tied to unemployment duration.

In addition a number of the studies raise questions about the possible adverse effects of linking displacement compensation with continuing unemployment and about the possibility that severance pay might discourage prompt job search. Portis and Suys [12], for example, point out that many Kelvinator workers may not have searched for work despite advance notice because they wanted to remain until final closing in order to receive severance pay. In addition to the problem that compensating for displacement losses might prolong unemployment, time lags between displacement and receipt of compensation may create an equity problem by directing compensations toward those on their way out of the labor force or those who have relatively limited attachment to work.

These incentive considerations underscore the importance of designing transition policies which do not in themselves increase the real or apparent costs of displacement.

RESEARCH IMPLICATIONS

This review of previous studies of earnings losses due to displacement suggests a number of ways in which the policy relevance and the reliability of future work can be improved. These include choosing data bases which are more likely to produce useful findings, avoiding errors in methodology that were made in the past, and providing clear data as a part of research output.

Data Bases

Most previous studies were based on single period surveys, but future work should rely more on longitudinal and administrative records. Surveys are most valuable for identifying individual characteristics and are least practical for developing longitudinal data and providing control groups, the importance of which was discussed above.

Longitudinal

Although what evidence there is suggests that losses persist, most previous work fails to discuss losses beyond the first year or two after layoff. More information is needed on the length and patterns of transition following displacement since losses over time seem to contribute substantially to total displacement losses and may be as deserving of compensation and trade policy consideration as are initial losses.

Many recent studies have demonstrated the feasibility of using on-going administrative records, such as Social Security earnings data, either alone or matched to survey data; data from firms on individual workers; or data from other administrative records such as Unemployment Insurance or Employment Service data.*

Survey

In contrast, the kinds of information best provided by survey data may already be at hand but do not have clear bearing on policy. The effects of worker characteristics on initial losses have been extensively documented in previous studies, but the relevance of differential losses across individuals to either trade barrier reduction decisions or to setting levels of compensation has not been established.

It is difficult to draw policy implications from loss differences among workers, and it may be difficult in practice to take such differences into account. Nevertheless, in some cases arguments can be made for doing so.

To the extent that the higher losses calculated for some groups reflect differences in their labor supply behavior, it is not clear whether they should be taken into account in either protection or compensation policy decisions. Where higher losses for some groups are the result of employer preferences (whether discriminatory or based on expected productivity) they may deserve greater consideration. Where differential

*ACDA [3], Jacobson [6], Pursell, Schriver and Bowlby [13], and Stern [15].
Orley Ashenfelter, "Estimating the Effects of Training Programs on Earnings with Longitudinal Data," presented at the Conference on Evaluating Manpower Training Programs, May 6-7, 1976, Industrial Relations Section, Princeton University.
Thomas F. Cooley, Timothy W. McGuire, and Edward C. Prescott, "The Impact of Manpower Training on Earnings: An Econometric Analysis," prepared for the Office of Program Evaluation, E.T.A., Department of Labor, September 1975.
Louis Jacobson, "The Use of Longitudinal Data to Assess the Impact of Manpower Training on Earnings," Center for Naval Analyses, 1973.
Arnold Katz, "Pennsylvania ESARS/CWBH Comparisons: First Results," Working Paper, October 1975.
David O'Neill and Sue Goetz Ross, "Voucher Funding of Training: A Study of the G.I. Bill," Public Research Institute, October 1976.

losses reflect loss of specific skills and seniority advantages, a strong case can be made for taking them into account. Similarly, where loss differentials across individuals reflect adaptive abilities and differences in search cost, they should probably be considered in both trade policy (on efficiency grounds) and compensation policy (on equity grounds).

Errors in Methodology

A major weakness displayed in nearly all these studies is the failure to deal with control group choices explicitly, and the failure to explain loss findings clearly in terms of the comparisons being made. Earnings loss studies in the future should document the experiences of the loss group, and should make explicit comparisons with the experiences of controls. Control or comparison groups should be essentially similar to the loss group, although statistical controls can be used to adjust for known differences.

Methodological errors which ought to be avoided in any future work include the use of an inappropriate control group, use of outcome variables as explanatory, failure to control for variation in time between layoff and interview, and failure to deal explicitly with the problem of distinguishing unemployment from non-participation in the labor force.

The labor force participation problem is difficult to resolve, both conceptually and empirically. Empirically, the distinction between unemployment and labor force withdrawal can only be made arbitrarily, depending on chosen definitional criteria. Since labor force withdrawal may be a consequence of displacement, the omission of designated withdrawals from analysis may ignore an important group with losses. On the other hand, workers who withdraw probably do more work at home than those who are employed, and so to attribute zero earnings to them will overstate their losses. Moreover, it is not obvious whether or how to make adjustments in earnings for home production.

Studies based on survey data may have an advantage over studies based on earnings records in dealing with this problem, in that surveys can distinguish death and disability from other causes of zero earnings. Also surveys can avoid the possibility of missing uncovered or untabulated earnings following termination from regular industrial employment. Otherwise, both kinds of studies must take similar considerations into account.

To the extent that losses are computed relative to the experiences of a valid control group, with average separation expectations, the magnitude of the labor force participation problem is reduced. The size of this problem can also be reduced by focusing on losses of prime-age males, who typically have very high rates of labor force participation, but this is not always appropriate because industries subject to plant closure are often heavily composed of women and older workers.

Data Output

Including edited and documented data as part of research output in addition to final written reports could be quite valuable, for several reasons.

First, in some cases, it would permit long-run follow-up data, such as Social Security earnings data, to be added later. Second, it would enable additional analyses and corrections to be made without great difficulty. For example, it would enable comparisons to be made between the loss group and controls other than those used in the study.

In addition, data sets developed independently could be analyzed in combination, providing a wider range in underlying conditions. Combined data sets, for example, might enable comparative studies to be made between displacement losses in several industries and under varying labor market conditions. This would be especially useful for assessing possible changes in trade policy, and would provide information enabling more effective compensation of losses.

STUDIES INDIVIDUALLY SUMMARIZED

[1] Case Studies of Displaced Workers, Bureau of Labor Statistics Bulletin No. 1408. Washington: U.S. Government Printing Office, 1964.

[2] Dorsey, John W. "The Mack Case: A Study In Unemployment," Studies In The Economics Of Income Maintenance. Edited by Otto Eckstein. Washington: Brookings, 1967, pp. 175-248.

[3] Fishman, Leslie; Allen, Jay; Bunger, Byron; and Eaton, Curt. Reemployment Experiences Of Defense Workers. Washington: U.S. Arms Control and Disarmament Agency, 1966.

[4] Foltman, Felician F. White And Blue-Collars In A Mill Shutdown. Ithaca, New York: Cornell University Press, 1968.

[5] Haber, William, Ferman, Louis A., and Hudson, James R. The Impact Of Technological Change: The American Experience. Kalamazoo, Michigan: The W.E. Upjohn Institute for Employment Research, 1963.

[6] Jacobson, Louis. "Estimating The Loss In Earnings For Displaced Workers In The Steel Industry," Chapter 5 in "Removing Restrictions On Imports of Steel." Arlington, Virginia: Center for Naval Analyses, May 1975.

[7] Levinson, David. "Displaced Pottery Workers' Adjustment To Layoff," Weathering Layoff In A Small Community, U.S. Bureau Of Labor Statistics Bulletin No. 1516. Washington: U.S. Government Printing Office, June, 1966.

[8] Lipsky, David B. "Interplant Transfer And Terminated Workers: A Case Study," Industrial And Labor Relations Review, Vol. 23, No. 2., Jan. 1970, pp. 191-206.

[9] McCarthy, James E. "Trade Adjustment Assistance: A Case Study Of The Shoe Industry In Massachusetts." Ph. D. Dissertation, Fletcher School of Law and Diplomacy, 1974.

[10] Miernyk, William H. Inter-Industry Labor Mobility: The Case of The Displaced Textile Worker. Boston: Northeastern University, 1955.

[11] Palen, J. John and Fahey, Frank J. "Unemployment And Re-Employment Success: An Analysis Of The Studebaker Shutdown," Industrial And Labor Relations Review, Vol. 21, No. 2, Jan. 1968, pp. 234-250.

[12] Portis, Bernard and Suys, Michel G. "The Effect of Advance Notice In A Plant Shutdown." London, Ontario: School of Business Administration, The University of Western Ontario, 1970.

[13] Purseil, Donald E., Schriver, William R., and Bowlby, Roger. "Trade Adjustment Assistance: An Analysis Of Impacted Worker Benefits On Displaced Workers In The Electronics Industry." Memphis, Tennessee: Center for Manpower Studies, Memphis State University, 1975.

[14] Shultz, George P. and Weber, Arnold R. Strategies For The Displaced Worker. New York: Harper & Row, 1966.

[15] Stern, James L. "Consequences Of Plant Closure," The Journal Of Human Resources, Vol. 7, No. 1, Winter, 1972, pp. 3-24.

[16] Thompson, Paul H. "The Effects Of Unemployment On Engineering Careers." 1972.

[17] Tolles, N. Arnold. "The Post-Layoff Experience Of Displaced Carpet Mill Workers," Weathering Layoffs In A Small Community, U.S. Bulletin of Labor Statistics No. 1516. Washington: U.S. Government Printing Office, June 1966.

ANNOTATED BIBLIOGRAPHY OF RELATED STUDIES

Bradburn, Norman M. Interplant Transfer: The Sioux City Experience. Chicago, Illinois: National Opinion Research Center, University of Chicago Press, May, 1964.

Study of the operation of an Armour interplant transfer plan, identifying demographic characteristics of transferees and transfer incentives. Concludes that employment security is the most important factor inducing workers to transfer.

The Economic Impact Of Reductions In Defense Spending. Washington: U.S. Arms Control and Disarmament Agency, 1972.

Summarizes the principal findings of 29 ACDA studies on the economic impact of reductions in defense spending. Four broad study categories cover the implications of military cutbacks for the national economy, for industries, for regions and communities, and for individual workers.

Lynch, John E. Local Economic Development After Military Base Closures. New York: Praeger, 1970.

Discusses local adaptations to base closures.

Smith, Robert F. "The Impact Of Mass Layoffs, July, 1963-June, 1965," Proceedings of the Industrial Relations Research Association, Dec. 1965, pp. 204-219.

Analysis of Employment Service reports of permanent mass layoffs. Presents tabulations by region of number of workers affected, and number of reporting establishments closing and remaining open. Also, tabulates number of days advance notice, industry categories, causes of layoff and occupation.

Weber, Arnold R., and Taylor, David P. "Procedures For Employee Displacement: Advance Notice Of Plant Shutdown," Journal Of Business, Vol. 36, No 3 July, 1963, pp. 302-315.

Analyzes programs for advance notification to employees and unions of impending plant shutdowns.

Weber, Arnold R. "The Interplant Transfer Of Displaced Employees," Adjusting To Technological Changes. Edited by Gerald R. Somers, Edward L. Cushman, and Nat Weinberg. New York: Harper & Row, 1963.

Analysis of union-management programs for interplant transfer of displaced employees within multi-plant firms.

Young, Edwin. "The Armour Experience: A Case Study In Plant Shutdown," Adjusting To Technological Changes. Edited by Gerald R. Somers, Edward L. Cushman, and Nat Weinberg. New York: Harper & Row, 1963.

Reviews the activities of the Armour Automation Committee, and describes Employment Service assistance programs to former employees of the Oklahoma City Plant.

STUDY SUMMARIES

Case Studies of Displaced Workers, 1964
Bureau of Labor Statistics

Five case studies were made of labor displacements due to technological change. The cases included a glass jar plant, a petroleum refinery, an automotive equipment plant, a floor covering plant, and two iron foundries. Measures for preventing or mitigating displacement effects were reviewed, such as use of natural attrition, early retirement, transfer, retraining, and timing to cyclical expansion.

Data and Methodology: 3,000 displacements were studied, using samples ranging from 90% of workers leaving small plants to 25% of workers leaving the largest plants. Cross tabulations were made from data obtained from company records, mail questionnaires sent out 6 to 21 months after layoff, and local Employment Service records.

Findings: In one case, where employment reduction took place over a 3-year period, half the reduction was achieved through attrition, with no accessions during the entire period. Early retirement incentives prevented the need for layoffs among an additional sixth. Although all subject companies were multi-plant, relocation allowances were not offered. In the two cases where transfer options were available, more workers elected transfer in the case where job security benefits were transferrable, despite the greater distance of the move.

About one-tenth of displaced workers were found to have dropped out of the labor force at the time of the surveys. Among those in the labor force, unemployment rates ranged from 8% to 50%. In five of the six areas, unemployment rates among displaced workers were 5 times those for the labor market as a whole. Long duration unemployment was prevalent: in 4 cases at least 40% of those displaced were unemployed for over half a year.

Age was strongly and positively related to lack of employment. Females had much higher unemployment rates as well as longer duration. Education showed a strong positive relation to reemployment. Skilled workers had far less unemployment than unskilled workers.

Few workers found jobs in the same industry, and many changed occupation. Most reemployed workers had lower hourly earnings, often 20% lower. The sharpest wage cuts were found for those over 45 or with low levels of schooling.

The Mack Case: A Study in Unemployment, 1963
John W. Dorsey

Displacements: Auto and aircraft manufacturing plant relocated in 1961. 3,000 displacements resulted; the company encouraged production workers to separate, although transfer was technically an option.

Purpose: To trace events leading to plant relocation and factors determining transfer, to analyze the reemployment problems of workers not transferring, and to review the financial adjustment of workers unemployed more than 6 months.

Data and Methodology: Tabular comparisons of workers transferring and not transferring. Regression analysis of months of unemployment for displaced workers remaining in the labor force; comparison of new wages with former wages for those reemployed. Data were collected by interview, about 9 months post-layoff, supplemented by Employment Service files for 251 non-transferring workers. Household budget data were obtained for workers unemployed over 6 months.

Findings: Supervisory and adminstrative workers transferred in large numbers and were given relocation assistance, whereas production workers were discouraged from doing so, in part by the offer of extremely generous separation benefits. The production workers who transferred were more highly skilled and more senior than the average. Ten months after the closing 23% were still unemployed. Wages fell about 33% for those reemployed.

Regression results for months of unemployment found age, residential concentration of impacted workers, and lack of education significantly associated with longer durations. Also, married females had relatively long unemployment duration. Among skill groups the semi-skilled had longest duration, since they had the least transferrable skills. Skilled workers were all employed at the time of the survey, and 80% of the unskilled were employed. Many who were employed at the time of survey had held more than one job since layoff, some with intervening unemployment.

Anecdotal evidence suggested that higher separation pay extended unemployment, but statistically the effect of the level of separation pay could not be distinguished from that of age. Workers unemployed for over six months tried to maintain their former consumption standards.

Reemployment Experiences of Defense Workers: A Statistical Analysis of the Boeing, Martin, and Republic Layoffs, 1968
Leslie Fishman, Jay Allen, Byron Bunger, and Curt Eaton

Study Circumstance: ACDA arranged with the University of Colorado in 1966 for a comparative and integrated analysis of three previously ACDA sponsored studies of layoffs and reemployment.* The layoffs had taken place between 1963 and 1965.

Data: 4 post-layoff surveys had been made of displaced workers. 5,000 of the 13,000 displaced Boeing workers were surveyed twice, the first survey 2-5 months after layoff, and the follow-up three months later. The Martin layoffs were spread over a year, and 4,000 displaced workers were surveyed 5-15 months after layoff. 10,000 Republic layoffs were surveyed within 3-16 months of displacement. Response rates ranged from 52% to 75%, yielding a total of 14,000 returned questionnaires. This study extracted comparable information from the 4 surveys, enabling combined and comparative analyses to be made.

Characteristics of Survey Sites: Republic was in a large labor market (New York); Boeing and Martin were in smaller and more isolated labor markets (Seattle and Denver) and were the dominant employers. Republic emphasized aircraft (the others aerospace), and had a relatively higher salary scale due to seniority. Martin's salary scale may have been relatively higher due to anticipation of the temporary nature of employment there. Boeing had substantially lower salary scales for similar jobs. Boeing workers had a reasonable probability of recall, and in fact many were recalled; the others did not.

In the three sites, at least 75% of respondents were male, and at least 15% had some college or trade school. 4% of the Martin workers had graduate work. At least 50% had more than two years of tenure.

Methodology: Chapter V presents multiple regression equations for each survey, using as dependent variables total unemployment duration, average loss, salary change, employment status, and total unemployment duration as percent of total possible duration at time of survey. Independent variables include previous salary, mobility, seniority, secondary earner status, home ownership, number of dependents, sex, education, age, defense reemployment. It is noted that R^2's do not exceed 0.25 .

A somewhat haphazard analysis of mobility looks at mobile and non-mobile subgroups, showing the mobile group to be younger, more highly educated, and more highly skilled, as well as having had more favorable reemployment experiences. The Boeing job information experiment is evaluated, but incorrectly declared free of self-selection bias.

*The DYNA-SOAR Contract Cancellation, 1975
Martin Company Employee Experiences, 1966
Post Layoff Experiences, Republic Aviation Workers, 1966.

Reemployment Experiences of Defense Workers (Continued)

Markov chain analysis is presented for reemployment probabilities, using a two-state and three-state model. This method is also used to analyze "disemployment" or temporary, unsatisfactory employment by demographic subgroups. Subgroups having high unemployment also tend to have higher proportions of unsatisfactory jobs.

Simple correlation of accepted salary with unemployment duration is presented, broken out 2 groups at a time.

Findings: The study finds half a year's salary to be the average approximate displacement loss. This loss is mainly due to unemployment (or labor force withdrawal) since average weekly wage reduction was not found to be large, varying from $6 to $19 in the four surveys. Unemployment duration ranges from 38% to 65% of the period from layoff to survey. Women were found to have the highest reemployment costs. Also faring worse in terms of unemployment duration, wage reduction, and overall loss, were older workers, less educated workers, those with high tenure, and those with fewer dependents.

Conclusions and Comments: The most important variables influencing reemployment are the demand in the local and aerospace labor markets and the quality of job search information. Variables such as age, education, and skill level account for relatively little of the variation in reemployment success. Improvement in information would appreciably reduce reemployment transition costs. Boeing's "placement control" operation dramatically reduced reemployment costs. The primary factor influencing geographic mobility is information.

The major conclusions drawn are not supported by the analysis. The regressions in Chapter V, in addition to being misspecified, do not have clearly defined dependent variables. The distinction between unemployment and labor force withdrawal does not appear to have been made.* The discussion of coefficients is not always consistent with the tabular evidence nor is the tabular evidence uniformly consistent with other sections of the study. Moreover, the total variation explained in these regressions is quite high relative to other studies using micro data. It would have been useful to run the regressions over the four surveys, with dummies or labor market characteristics added for each site.

The authors' preference for formal job search may not be justified. They dismiss personal contact as an "inefficient" method. The self-selection bias in the Boeing job information experiment is not fully recognized.

*Poor tabular labeling and organization often made it difficult to find out what was done in this study.

White- and Blue-Collars in a Mill Shutdown, 1968
Felician F. Foltman

Displacements: Over 1400 steelworkers were given up to one year's notice of plant shutdown, in Buffalo, 1963.

Purpose: To study workers' attitudes and adaptive behavior after a layoff, and to compare the reemployment success of white and blue collar workers.

Characteristics of Displaced Workers: Most were over 40, 36% were over 50, 95% were male, 36% had high school degree.

Data: Questionnaires sent to 1455 workers about 9 months after layoff; 486 responses were used, written over a period of 6 months.

Methodology: Cross-tabulations of reemployment outcome measures, such as employment status and earnings, for white and blue collar workers by factors such as age, education, property ownership, and search methods.

Findings: White collar workers were more successful in finding permanent jobs, and adjusting to their new situation. They were also more mobile and had better knowledge of the job market. Approximately 40% of blue collars were unemployed at survey compared to 15% of white collars. 75% of workers suffered reductions in pay. Age, lack of education, and lack of skill hindered reemployment. During the notice period, 59% of workers made no search effort at all, 19% made an intensive search. SUB-UI, pension, and severance pay benefits were generous.

Comment: Although this study contains useful information, empirical results are not clearly presented. Hypotheses of limited usefulness are formulated and tested, about economic "maximizing" behavior of white collar workers and "satisficing" behavior of blue collar workers.

The Impact of Technological Change: The American Experience, 1963
William Haber, Louis A. Ferman, and James R. Hudson

Critical literature review of 17 studies, done between 1929-1961, on adjustment to job displacement. The studies were selected for comparability and importance. Tabular summary and bibliography from the original study* are included following this summary.

Nature of Studies: The studies reviewed did not use regression techniques. Sample sizes averaged about 50% of number displaced, which ranged from 300 to 15,000. Average time between survey and displacement was about a year; the maximum was 30 months.

Findings: Age, sex, education, skill level, and labor market conditions were found to be the factors most consistently affecting successful reemployment. Age exerted a negative effect, except for two studies showing that workers under 30 were reemployed less rapidly than 30-45. Females almost always had less successful reemployment experience, as did less skilled workers. The size of the skill effect varied between studies. Where skilled workers were being displaced due to increased mechanization, their advantage was reduced or eliminated. People with more education had an easier time becoming reemployed, and less likelihood of suffering wage losses. The studies did not usually distinguish seniority from age, but seniority seemed to make little difference except where union seniority could be retained. Labor market strength was found to strongly increase the likelihood of reemployment.

The effect of retraining programs was found to be unclear, as was the effect of transfer programs. It was observed that transfer offers were made more often to skilled workers and that people are reluctant to move a long distance. Severance pay was found to soften the financial burden of displacement rather than to finance out-of-pocket job search expenses. Evidence on this point came from spending surveys and comparisons of the reemployment experiences of workers receiving and not receiving severance pay.

Reemployed workers often changed industry and occupation, and suffered wage losses. Many new jobs were of short duration, leading to subsequent unemployment spells. Few workers were geographically mobile, but most managed to find jobs and not many suffered long-duration unemployment.

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Bibliography

(1) **Adams, Leonard P., and Robert L. Aronson.** *Workers and Industrial Change.* Ithaca, N. Y.: Cornell University, 1957. 209 pp.

(2) **Clague, Ewan, Walter J. Couper, and E. Wight Bakke.** *After the Shutdown.* New Haven: Yale University, 1934. 153 pp.

(3) **Creamer, Daniel, and Charles W. Coulter.** *Labor and the Shut-Down of the Amoskeag Textile Mills.* [U.S.] Works Progress Administration. Report no. L-5 of the National Research Project. Philadelphia: Works Progress Administration, November 1939. 342 pp.

(4) **Creamer, Daniel, and Gladys V. Swackhamer.** *Cigar Makers—After the Lay-Off: A Case Study of the Effects of Mechanization on Employment of Hand Cigar Makers.* [U.S.] Works Progress Administration, Report no. L-1 of the National Research Project. Philadelphia: Works Progress Administration, December 1937. 93 pp.

(5) **Ferman, Louis A.** *Death of a Newspaper: The Story of the Detroit Times.* Kalamazoo, Michigan: The W. E. Upjohn Institute for Employment Research, April 1963. 63 pp.

(6) **Ferman, Louis A., and James R. Hudson.** *Job Dislocation Among Brass Workers in a Small Community.* Unpublished data on file in the University of Michigan-Wayne State University Institute of Labor and Industrial Relations, 1959.

(7) **Fowler, Irving, and Luke M. Smith.** *Ford Relocation Follow-Up Study.* Unpublished data on file in the School of Social Work, University of Buffalo, Buffalo, N. Y., 1958.

(8) **Lubin, Isador.** *The Absorption of the Unemployed by American Industry.* Washington: Brookings Institute, 1929. 42 pp.

(9) **Myers, Charles A., and George P. Shultz.** *The Dynamics of a Labor Market.* New York: Prentice-Hall, Inc., 1951. 219 pp.

(10) **Myers, Robert J.** "Occupational Readjustment of Displaced Skilled Workmen," *Journal of Political Economy,* XXXVII (August 1929), pp. 473-89.

(11) **Palmer, Gladys L., and Constance Williams.** *Reemployment of Philadelphia Hosiery Workers After Shutdowns in 1933-34.* [U.S.] Works Progress Administration, Report no. P-6 of the National Research Project and Industrial Research Department, University of Pennsylvania. Philadelphia: Works Progress Administration and University of Pennsylvania, January 1939. 100 pp.

(12) Sheppard, Harold L., Louis A. Ferman, and Seymour Faber. *Too Old to Work—To Young to Retire: A Case Study of a Permanent Plant Shutdown.* Special report. U.S. Senate, Special Committee on Unemployment Problems, 86th Cong., 1st sess. Washington: Government Printing Office, 1960. 74 pp.

(13) Sheppard, Harold L., and James Stern. "Impact of Automation on Workers in Supplier Plants," *Labor Law Journal,* VIII (October 1957), pp. 714-18.

(14) Wilcock, Richard C. "Impact on Workers and Community of a Plant Shutdown in a Depressed Area," *Monthly Labor Review,* LXXX (September 1957), pp. 1047-52.

(15) **Wilcock, Richard C., and Walter H. Franke.** *1962 Resurvey of Former Armour and ABC Workers.* Unpublished mimeographed manuscript prepared for the Armour Automation Committee, Governor's Committee on Unemployment (Illinois), and U.S. Bureau of Employment Security, July 1962. 10 pp.

(16) ——— ——— *Oklahoma City Survey of Former Armour Workers, 1960-1961: Impact of the Plant Shutdown on Unemployment, Jobs, and Economic Status.* Unpublished mimeographed manuscript submitted to the Armour Automation Fund Committee, June 26, 1961. 72 pp.

(17) ——— ——— *Three City Survey of Former Armour Workers, 1960: Impact of Plant Shutdowns on Unemployment, Jobs, and Economic Status.* Unpublished mimeographed manuscript submitted to the Armour Automation Fund Committee, January 1961, with minor revisions in August 1961. 202 pp.

(18) Wisconsin State Employment Service. *LaCrosse Reemployment Study.* Unpublished paper distributed by Wisconsin State Employment Service in cooperation with the Unemployment Compensation Department, September 1960. 21 pp.

SUMMARY OF DATA ON SEVENTEEN STUDIES OF JOB DISPLACEMENT[a]

N—Number of cases. Indicated only when the number differs from the size of the study sample (Col. 5). n.i.—Not indicated in study.

Study (and year begun)	Location	Industry	Number of Displaced Workers	Size of Study Sample	Duration of Study Period[b] (mos.)	Severance Pay	Workers With New Jobs (percentages unless otherwise indicated)												Significant Factors Affecting Reemployability
							Skill Level Relative to Old Job[c]			Wages Relative to Old Job			Reemployed in Same Industry	Self-Employed	Employed in Same Kind of Work	Method by Which New Job Found		Reemployed Within One Month[d]	
							Same	Lower	Higher	Same	Lower	Higher				Formal	Informal[e]		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
Robert J. Myers 1929	Chicago, Ill.	clothing mfg.	300-500	370	18	$500 to voluntary quits	not indicated			23.2	46.4	30.4 (N = 276)	20.0	4.6	20.3	not indicated		40.0 (N=240)	Age and Sex. Men in the 35-39 age group were more successful than others.
Lubin 1929	3 major metropolitan labor markets	20 industries	n.i.	750	12	n.i.	not indicated			27.1	43.0	18.8[e] (N = 410)	32.7 (N=410)	n.i.	45.9 (N=410)	not indicated		11.0 (N=413)	Age. Workers under 45 years were more successful than others.
Clague, Couper, and Bakke 1929	New Haven, Conn.	rubber (footwear) mfg.	729	672	11	based on service	32	57	11 (N = 158)	h	72.7	h (N = 502)	n.i.	3.2 (N=523)	n.i.	n.i.	82.7[e]	62.1 (N=518)	Skill. Skilled men were less successful than unskilled men.
Clague, Couper, and Bakke 1929	Hartford, Conn.	rubber (tires) mfg.	1,105	534	11	none	not indicated			h	91.2	h (N = 420)	n.i.	n.i.	n.i.	not indicated		56.5 (N=441)	Sex. Younger women were more successful than men.
Palmer and Williams 1936	Philadelphia, Pa.	textile (hosiery) mfg.	1,745	673	30	n.i.	not indicated			not indicated			j	n.i.	n.i.	not indicated		26.4 (N=617)	Skill. Reemployment was related to skills adaptable to changing technology. Age. Workers over 50 years were less successful
Creamer and Coulter 1936	Manchester, N. H.	textile mfg.	15,000	1,068	13-22	n.i.	not indicated			not indicated			25.4 (N=319)	n.i.	n.i.	not indicated		23.7 (N=310)	Age. Workers over 55 years were less likely to find jobs Sex. Women under 34 years were less likely to be reemployed than men, women over 31 years had the same chance as men.
Creamer and Swackhamer 1937	Manchester, N. H.	cigar mfg.	600	328	60	none	not indicated			k	k	k	40.6[f] (N=143)	39.6[m] (N=116)	n.i.	not indicated		12.9 (N=116)	Age. Older workers were less successful than others Skill. Obsolescence of skills made reemployment difficult.
Myers and Shultz 1948-49	Nashua, N. H.	textile mfg.	3,500	sample I 55 quits	10	n.i.	64	20	9[e] (N = 51)	14	54	23[e]	43	n.i.	n.i.	2.0	78.0	82.0	Early Quitters. Workers who quit before shutdown had more success than others
				sample II 150 layoffs			73	17	4[e]	37	41	14[e]	68			4.0	83.0	65.0	
Adams and Aronson 1949-50	Auburn, N. Y.	heavy machinery mfg.	1,707	334[n]	18-54[n]	based on service	56	28	16 (N=141 at 54 months)	34	28	37 (N=145 at 54 months)	38 (N=145 at 54 months)	n.i.	41 (N=309 at 18 months)	1.3	79.0 (N=145 at 54 months)	n.i.	Available job opportunities more important than personal and social attitudes
Sheppard and Stern 1956	Detroit, Mich.	auto parts mfg.	5,000 (approx.)	348	12	none	not indicated			not indicated			n.i.	n.i.	n.i.	not indicated		n.i.	Age. Most significant factor — the older the workers, the less chance of their reemployment Skill. Less skilled were less successful than others Sex. Women were less successful than men Race. Negroes were less successful than whites

Wilcock 1956	Mt. Vernon, Ill.	steel car mfg.	1,908	1,539	30	none	not indicated	not indicated	11.0[a] (N=1,162)	40.0 (N=1,162)	15.0[a] (N=1,162)	not indicated	n.i.	*Education.* Most important factor—the less educated were less successful than the better educated. **Age.** Workers over 45 years had less reemployment.
Sheppard, Ferman, and Faber 1957-58	Detroit, Mich.	automobile mfg.	4,500	sample I 185 sample II 314	15 24	none	64 21 15 (N = 132) q 45 q (N = 30)	not indicated	27.0 (N=180) n.i.	n.i.	n.i.	5 86 (N=116) not indicated	n.i.	**Age.** Most important factor — the older workers were less successful than others **Skill.** Skilled workers were more successful than semiskilled and unskilled workers
Fowler and Smith 1958	Buffalo, N. Y.	automobile mfg.	1,100	256	6	none	q 18 q (N = 72)	h 46.0 h (N = 72)	n.i.	4.0 (N=78)	n.i.	3.0 54.0 (N=58)	24.0 (N=78)	*Seniority.* Workers with high seniority transferred to another plant. **Age.** Youth or old age were not significant factors in reemployment.
Ferman and Hudson 1959	Adrian, Mich.	aluminum mfg.	617	487	15	none	not indicated	not indicated	n.i.	18.8 (N=260)	n.i.	6.0 84.0 (N=260)	54.0 (N=260)	**Age.** Older workers were reemployed less frequently than younger workers. **Education.** Less educated were reemployed less frequently than others. **Mobility.** Geographically mobile workers were more successful than others
Wisc. State Employment Service 1960	La Crosse, Wisc.	auto parts mfg.	1,735	1,095	9	n.i.	not indicated	15.0 57.0 14.0[p] (N = 418)	45.0 (N=418)	n.i.	n.i.	26 59 (N=397)	n.i.	**Age.** Younger workers were more successful than older workers. **Sex.** Men were more successful than women **Skill.** Skilled workers were reemployed more often than less skilled workers.
Ferman 1960-61	Detroit, Mich.	newspapers	1,267	sample I (mail) 297 sample II (interview) 232	6	for editorial and commercial workers	not indicated	not indicated 44 37 19 (N = 185)	49 (N=157) 80 (N=185)	n.i. 1.7 (N=185)	n.i.	2 79 (N=157) 2 52 (N=185)	58 (N=157) 88 (N=185)	*Skill Level.* More important than age or education
Wilcock and Franke 1960-61	East St. Louis, Ill.; Columbus, Ohio; Fargo, N. Dak.	meat packing and processing	2,411	sample I (mail) 1,920 sample II (interview) 243	12	for all workers	28.9 36.1 35.0 (N = 926) 22.4 59.5 18.1 (N = 183)	not indicated	13 (N=926) n.i.	n.i.	n.i. 19 (N=160)	5 72 (N=928) 7 70 (N=182)	12 n.i.	**Age.** Older workers were less successful than younger workers. **Race.** Negroes were less successful than whites. **Education.** Less educated were less successful than the educated. **Sex.** Women were less successful than men **Skill.** Nontransferability of skills impeded reemployment
Wilcock and Franke 1960-61	Oklahoma City, Okla.	meat packing and processing	446	237 late layoffs (mail) 134 early layoffs (interview)	6	for all workers	not indicated	not indicated 7 93 — (N = 55)	n.i. 14.0 (N=55)	n.i.	14 (N=97) 14 (N=59)	4 73 (N=100) not indicated	54 (N=113) n.i.	**Sex.** Women were less successful than men **Race.** Not a factor **Age.** Workers over 45 years found new jobs less often **Education.** Better educated were more successful than less educated.

[a]There are 2 entries for the Clague, Couper, and Bakke study.
[b]Duration of study period is the period of time between the shutdown and the solicitation of data from the respondents.
[c]Based on *Dictionary of Occupational Titles.*
[d]This means referral by a company, union, or state or private employment agency.
[e]This means referral by friends or relatives, direct application to a company, or solicitation from prospective employers.
[f]The jobs consisted of 30 hours or more of work per week, regardless of their duration.
[g]*Total percent* does not equal 100 because some respondents did not give information.
[h]"Same" and "higher" designations were combined; thus figure was given only for the percentage of workers who were reemployed *at a lower wage.*
[i]Data were given for successful methods of obtaining 861 jobs.
[j]Study was limited to displaced hosiery workers who were either seeking work in the hosiery industry or who had been reemployed in that industry.
[k]Percentages were not available, but median income of displaced workers was approximately one-half of their income in last 6 months of work.
[l]Self-employment was included.
[m]At the time of interview. No data were reported for total self-employment during the study period.
[n]334 ex-Harvester workers were interviewed at home 18 months after the shutdown. A mail questionnaire was sent to 145 of these workers 54 months after the shutdown.
[o]*The investigator reported that 11 percent* were reemployed in the same industry at the time of the interview. No data were reported for industrial classification of all jobs during the study period.
[p]Percent in same occupation at the time of the interview. No data were reported for occupational classifications during the entire study period.
[q]"Same" and "higher" designations were combined; thus figure was given only for the percentage of workers who were reemployed at a lower skill level.

Estimating the Loss in Earnings for Displaced Workers in the Steel Industry, 1975
Louis Jacobson

Displacements: Arising from employment declines in the steel industry, 1957-1972.

Purpose: To estimate the losses in earnings to steel workers that would arise from removal of import restrictions. The work summarized here is part of a larger study on removing restrictions on steel imports, which provided estimates of reductions in labor demand under alternative assumptions. For projected reductions in employment, this study calculates the number of workers who would be displaced and their resulting losses in lifetime earnings.

Data: Records on 20,000 male workers in the steel industry from the Social Security Administration's Longitudinal Employer-Employee Data file, 1957-72. File contains age, sex, race, quarterly earnings by employer. Earnings exceeding the Social Security maximum were estimated. Records with no taxable earnings after separation from steel employment were omitted from the study.

Methodology: Part I of the study estimates losses per displaced worker by age and experience. In Part II, the probabilities of displacement are calculated, again by age and experience, for projected employment reductions.

In Part I displacement losses are calculated using a regression model of income determination, in which earnings are expressed as a function of race, age, tenure, region, previous earnings, and displacement. This method constructs a statistical control group, yielding earnings loss estimates which represent the difference in earnings between displaced workers and similar workers who were not displaced. In order to distinguish earnings losses due to displacement from losses due to normal attrition (not directly separable in the data) the model was refined to identify workers in declining and non-declining firms as well as separatees and non-separatees. The assumption was made that workers separating from non-declining firms represent normal attrition, and that variation in the attrition rate between rising and falling firms is accounted for by differences in the age and tenure of their labor forces. The assumption was also made that earnings losses due to attrition vary by age and tenure, but do not vary otherwise systematically between firms. Given these assumptions, the earnings losses due to displacement are calculated for each age-tenure group as a weighted difference of the earnings loss due to attrition and the earnings loss due to separation for any reason.

The model also enables estimates to be made of earnings losses to stayers in falling firms. Introduction of a measure of earnings stability enables earnings losses to be divided between those caused by wage reduction and those caused by unemployment. Earnings losses were calculated for up to seven years beyond the initial year. The model was also expanded to estimate the impact of labor market conditions and labor market size on earnings losses.

Estimating the Loss in Earnings for Displaced Workers in the Steel Industry (Continued)

The number and characteristics of workers who would be displaced given projected employment reductions are estimated in Part II, again by netting out age-tenure specific attrition rates. Unlike Part I, however, attrition rates are estimated from rising years rather than from rising firms. The assumption is made that normal attrition rates would be independent of business cycle conditions. Given the projected employment change, displacement is calculated as a residual, after accounting for accessions and attritions.

Displacement probability curves by relative seniority are identified, which allow estimation of the characteristics of the displaced to depend not only on absolute tenure but relative seniority. The displacement probability curves further allow estimates of displacement proportions to be made beyond those for observed levels by use of interpolation and extrapolation.

Findings: Under realistic assumptions about future economic conditions, removal of restrictions on steel imports would not cause heavy losses. About 2500 workers out of 600,000 in the industry would be displaced (another 2,500 would leave by normal attrition), and their total loss in future earnings would amount to about 24 million dollars, averaging $9500 per worker.

Since the normal rate of attrition in the steel industry was found to be very low except among new employees and those near retirement, displacement losses and the extent to which employment reductions could be absorbed through natural attrition are found to depend heavily on the age-tenure composition of the labor force. The composition of the labor force, again because of attrition patterns, is strongly influenced by previous trends in employment. Losses due to a 3% employment decline would be 65% higher if incurred after a period of decreasing rather than increasing employment.

For the nine age-tenure groups considered attrition losses exceeded displacement losses for six groups during the first year after separation. This reflects the reasons for normal attrition in the high-wage steel industry: workers would rarely leave for a better job, but would more typically leave for an easier job, or because of injury, disability, or incompetence.

Displacement losses by age and tenure group appear to be positively related to tenure, holding age constant, and holding tenure constant appear greater for young workers than for prime age workers.

Losses for workers not displaced from declining firms are calculated to be about $300. About half of separation losses are attributed to wage reductions and half to unemployment. It is found that losses persist over time, with the loss of the second five years after separation approximating 50% of that of the first five years. Beyond that, it is not known whether annual losses would persist or continue to decrease.

Estimating the Loss in Earnings for Displaced Workers in the Steel Industry (Continued)

Lifetime losses are computed by discounting future estimated losses by 5% per year. Lifetime losses are greatest for prime age workers, reflecting the fewer periods over which losses are aggregated for older workers and the earlier earnings recovery of younger workers.

Labor market conditions are found to affect losses strongly. An increase of one standard deviation in the unemployment measure (1.4 percentage points) produces a $324 greater loss the first year. A decrease of one standard deviation in labor market size (700,000) produces a $108 greater loss the first year.

Income losses of displaced steel workers would be less than earnings losses by the amount of income maintenance payments received, in the form of pensions, severance pay, and SUB and UI benefits. Workers over 55 are likely to qualify for pensions and early retirement pay, which would generally more than make up for the displacement losses calculated. Less than 30% of the earnings losses estimated for displaced workers under 41 years old may have been replaced by SUB and UI benefits combined. Severance pay - 4 weeks wages for workers with 3-5 years tenure up to 8 weeks for workers with over 10 years tenure - would replace roughly half the calculated earnings loss for workers waiving SUB and accepting permanent layoff status. Since severance pay is included in the Social Security earnings data used in this study, earnings losses are to that extent underestimated for workers with over 2 years of tenure. For the 41-53, over 3 years of tenure group, earnings losses for the first year may be underestimated by as much as $1,000.

Displaced Pottery Workers' Adjustment to Layoff, 1966
David Levinson

Displacements: 13 potteries in W. VA., Ohio, and Penna. laid off over 2,000 workers, between 1959 and 1962. 6 potteries closed.

Characteristics of Displaced Workers: Most were over 45, with low education and skill. Half had over 15 years tenure, most had very long community residence.

Data and Methodology: Cross tabulations of data obtained from mail questionnaires to all former employees; 1468 responses to part one and 1303 to part two.

Findings: About one out of seven had unemployment duration of over 6 months. Reemployment was less likely for older workers, females, unskilled, and low education groups. Labor market strength may have dominated demographic factors in influencing reemployment. 35% of reemployed workers retained the same occupational title; half changed industry.

Comment: Despite the wide variation among respondents in time from layoff to survey - over three years - time to survey was not controlled in tabulations. Tabular formats were not well designed.

Interplant Transfer and Terminated Workers: A Case Study, 1970
David B. Lipsky

Displacements: In 1962 General Foods gave 2-3 years' notice that 4 plants would close, displacing 1800, and that transfer or severance pay would be available to all workers.

Purpose: To determine the factors associated with workers' decisions to transfer, and study the labor market experiences of terminated workers.

Data and Methodology: Regression analysis compared with cross-tabulations of weeks of unemployment between jobs. Cross-tabulations of demographic factors and transfer status. Data gathered via questionnaire within 9 months of layoff from 116 workers terminated from Boston plant and from 215 transferred workers.

Findings: The workers most likely to benefit from transfer opted for it least frequently. Less than 1/4 transferred, mostly salaried, males, younger, most skilled. Among terminated workers, weeks of unemployment were longest for workers who were females, older, less educated, less skilled, had fewer dependents, less family income, and more severance pay. In the regression analysis, however, only age and number of dependents were significant. Severance pay was rarely reported as being directly spent on search or retraining, but was used to ease the financial burden of displacement.

Trade Adjustment Assistance: A Case Study of the Shoe Industry in Massachusetts, 1974
James E. McCarthy

Displacements: Arising from plant closings and layoffs in the shoe industry in Massachusetts due to import competition and eligible for adjustment assistance prior to 1973.

Purpose: To study the effects of layoffs and the effects of adjustment assistance.

Characteristics of Displaced Workers: The average age was 55, and 18% were over 65. Experience in the shoe industry averaged 26 years. Almost 40% were secondary workers, mostly female, white; only 20% were high school graduates.

Data and Methodology: Regression analysis of weeks of unemployment, weeks of UI benefits, wage change to next job, and wage change to survey. Independent variables included demographic factors, years with the last employer, years in industry, unemployment rate and trend, and amount of layoff notice. Data were collected from 200 interviews, which averaged 40 months between layoff and survey, unemployment insurance files, and firms. McCarthy was careful to validate interview responses against files, noting that in Bale's ILAB survey, interview responses tended to be inaccurate.

No control group was used, but findings were compared with the results of a survey and two plant closing studies. Historical background of Trade Adjustment Assistance was reviewed, administration of adjustment services evaluated, and firm assistance programs reviewed.

Findings and Conclusions: Trade Adjustment Assistance was ineffective. Displaced workers suffered severe losses, with one-fourth never finding another job, and half not employed full time an average of 40 months after layoff. Real wage declines averaged 13% overall, and were limited to women; men increased their real wages. Unemployment benefits were received an average of 31 weeks, and weeks of unemployment before rehiring average 18 weeks. Men were reemployed more easily than women, younger workers more easily than older, and those with more experience in the industry had a harder time. Those finding reemployment in the industry, however, had less unemployment and better wage changes than others. More highly skilled workers had longer unemployment duration, but surprisingly collected fewer weeks of UI benefits. Weeks of notice was associated with reduced weeks of benefits, but was not significantly related to total unemployment duration.

McCarthy recommends that lump sum compensation, based on years with company, replace benefits tied to unemployment duration.

Trade Adjustment Assistance: A Case Study of the Shoe Industry in Massachusetts (Continued)

Comment: Most of McCarthy's conclusions follow logically from his analysis. The conclusion that women and older workers need special help, however, is not justified. Although his regression results find greater losses for these groups and confirm the predictions of human capital theory that employers would discriminate against them in rehiring, he fails to take into account the likelihood that these groups have different labor supply functions. His results cannot distinguish between women and the old looking for better working conditions or having better non-market opportunities than others on the one hand, and women and the old being discriminated against in the labor market on the other.

The regression results are marred by frequent significant signs in unexpected directions and erroneous specification of industry of current job as an independent variable. Actually, industry of current job is simultaneously determined with the other dependent variables. Including this variable may have increased the R^2's and reduced the t's on the other variables. Even so, the overall explanatory value of the regressions is extremely low.

Most of the results, however, are consistent with expectations and with each other. From the similarity in results between the initial wage change equations and the wage change to job at survey equations, McCarthy concludes that the human capital loss involved in displacement seems to persist over time. While it is not strictly warranted to draw such a conclusion without comparing displaced workers with a control group over time, the evidence is consistent with the reasonable expectation that losses would persist.

Inter-Industry Labor Mobility: The Case of the Displaced Textile Worker, 1955
William H. Miernyk

Displacements: Six case studies cover plant liquidations and one permanent large employment reduction in New England, 1952-53, numbers of displacement ranging from 300 to 7,000.

Purpose: To assess how difficult it is for displaced industrial workers to transfer to new industries or to enter non-manufacturing occupations.

Data: Payroll data from company or union provided names of displaced workers. Samples ranged from 10% to 100%. Information collected by personal or mail interview. Cases were selected to include some variation in time, geographic location, and labor market characteristics. Time between displacement and interviews ranged from under a year to 2-1/2 years.

Methodology: Cross-tabulations of labor market experience by age and sex.

Findings and Conclusions: Displaced workers tended to be old, and immobile, both geographically and industrially. Although textile employment was declining, reemployed workers found more jobs in their old industry than in any other. Fewer than half of the displaced workers were reemployed and almost 1/3 were without employment continuously from displacement to survey. Most unemployment spells were less than 10 weeks. Age and female status were associated with lack of employment. Most reemployed workers suffered wage reductions. Workers were generally poorly informed about local labor market conditions. The policy conclusion is drawn that workers' knowledge of job opportunities and mobility might be enhanced by programs of testing, retraining, and placement efforts in conjunction with local employment development activities.

Comment: Although technically unsophisticated, this study is notable for its level of insight and care of exposition.

Unemployment and Reemployment Success: An Analysis of the Studebaker Shutdown, 1968
John J. Palen and Frank J. Fahey

Displacements: 8,391 were laid off, largely without notice, when the South Bend, Studebaker plant closed in 1963, following earlier employment declines.

Characteristics of Displaced Workers: Average seniority was over 20 years, median age 50, mostly unskilled male workers of low educational level.

Methodology: 368 male workers who were employed just prior to closing were interviewed. The survey was made 4 months after the plant closed, with some follow-up 4 months later. Chi-square and regression analysis of employment status after layoff are done by age, education, skill, income, race, political party, and religion.

Findings: 54% of the displaced were unemployed at the time of survey, 37% after the 8 month follow-up. The closed plant was large relative to the local labor force, and consequently the area's unemployment rate rose substantially from 2.4% to 9.1%. Age was the most important explanatory variable, inversely related to reemployment, and education was also significant, but in the opposite direction. Most workers did not desire self-employment.

Comments: Unemployment tabulations from the first survey are seriously exaggerated since all workers without jobs were considered to be unemployed. The effect of age on reemployment is overestimated, both because older workers are more likely out of the labor force and younger workers were laid off first and had more time in which to find a job. This latter bias could have been avoided by including time since layoff in the regression.

Severance pay varied substantially; the data may have allowed estimates to be made of the impact of severance pay on the duration of unemployment.

The Effect of Advance Notice in a Plant Shutdown, 1970
Bernard Portis and Michel G. Suys

Displacements: In 1969, a Kelvinator plant closed in London, Ontario, displacing 500 following earlier layoffs.

Purpose: The study aim was to see whether advance notice aided the reemployment of older production workers, who seemed to have the hardest time in other closings.

Characteristics of Displaced Workers: Average age 44, mostly "assemblers," unskilled, low education. Average pre-displacement wages were $3 per hour.

Data and Methodology: Selected data and cross-tabulations from interviews prior to shutdown, and from survey of 237 former employees 1 month after shutdown. Little reported from 7 months post shutdown survey.*

Findings: 25% of production workers but 75% of foremen, executives and office staff found new jobs before shutdown. It is concluded that advance notice cost the employers little, but benefited workers, although there is little evidence that older production workers benefited very much.

Job search intensity, reemployment, and wage gains were inversely related to age. Reemployment was also associated with more education. One month after layoff, 49% were unemployed and 10% had dropped out of the labor force. Up to 42% may have found jobs during the notice period. Among older workers, it is hard to distinguish between poorer opportunities and the desire for severance pay as causes of more unemployment and failure to find a new job before layoff.

*Results of 7 months post-shutdown survey are presented in Consequences for Older Workers of a Plant Closing, Portis, Lenoir, and O'Connor. This survey showed 60% employed full time. It is not separately summarized in this review, as there are some apparent inconsistencies with the earlier survey.

Trade Adjustment Assistance: An Analysis of Impacted Worker Benefits on Displaced Workers in the Electronics Industry, 1975
Donald E. Pursell, William R. Schriver, and Roger Bowlby

Displacements: An RCA electronics plant closed in Memphis, Tenn., in 1970. This plant had opened in 1965, and employed 4000 workers at its peak.

Purpose: To determine the effects of impacted worker assistance on worker adjustment, including unemployment duration, earnings changes, and mobility.

Data: From a sample of 397 workers laid off within 4 months of shut down, 272 provided responses to an initial and 2 year follow-up questionnaire, and authorized access to their Social Security earnings records. A "control group" of 357 UI applicants was selected in June, 1971 and of these, 162 provided completed initial and follow-up questionnaires, and authorized access to their Social Security earnings records.

Methodology: Regression analysis of employment status in March 1971, 1971 earnings, 1973 earnings, and earnings changes defined in several ways. Included as independent variables are sex, race, age, weeks of unemployment, education, a skill proxy, control group status, and a training dummy. Part II contains regression analysis of unemployment duration and labor force participation. Also, the industrial and occupational mobility of reemployed workers is described and discriminant analysis is presented of earnings, unemployment duration, and weeks of economic activity.

Characteristics of Displaced Workers: 80% were operatives, 75% were female, 50% black, 10% skilled.

Findings and Conclusions: Workers receiving Trade Adjustment Assistance benefits adjusted less satisfactorily according to all measures than did workers not receiving benefits. Training was associated with occupational mobility, but not with improved earnings. Males readjusted more successfully than females, according to all measures. Also, skill was significant in most regressions as a determinant of reduced unemployment and higher earnings. Education was significant occasionally, and age rarely. More weeks of unemployment benefits were associated with diminished earnings. Impacted workers were unemployed an average of 50 weeks - controls averaged 25 weeks.

Comment: The overall conclusions reached, "Extended unemployment insurance supplemented by trade readjustment allowances (UI-TRA) did not seem to have a positive effect upon protecting workers' earnings or in easing adjustment" (p. 265), and "Extended impacted benefits, in some cases, may have harmed a worker's ability to adjust to reemployment" (p. 267) are not justified by the analysis. Although the authors acknowledge problems with the "control group," they interpret the control group variable as signifying only the absence of impacted worker assistance.

Trade Adjustment Assistance: An Analysis of Impacted Worker Benefits on Displaced Workers in the Electronics Industry (Continued)

The "control group," which consisted of unemployment insurance applicants, differed in many essential aspects from the displaced workers. The controls must have had more relevant labor market experience, since their most recent occupation had not suddenly become massively redundant, as was the case for many of the impacted workers. Moreover, 20% of the controls expected recall. In part because of stormy employer-employee relations in the closed plant, the impacted workers often encountered hostile responses from prospective employers. Also, since many of the impacted workers were drawn into the industrial labor force by the opening of the new plant, there is reason to believe that the impacted workers had better non-market alternatives than the controls.

In addition to the control group problem, the authors are incorrect in interpreting the negative coefficient of weeks of benefits on earnings as signifying harm to reemployment prospects. Actually, with the data at hand, it was not possible to test for the impact of TAA benefits on reemployment success. Weeks of unemployment should not have been used as an independent variable, since it is determined simultaneously with reemployment outcome. As modeled, the negative coefficient on benefit weeks merely indicates falling acceptance wages.

Strategies for the Displaced Worker, 1966
George P. Shultz and Arnold R. Weber

Displacements: 6 major Armour plants closed in 1959-65, following other sharp employment cutbacks, displacing about 6,000.

Background of Report: In 1959, Armour & Co. and several unions established the Automation Fund Committee, in response to labor displacement arising from a modernization program. The committee, with union, management, and academic members, was tasked with studying the problem, and developing programs to minimize the costs of displacement. The committee's work did not provide clear cost of displacement estimates, or comprehensive evaluations of ameliorative programs (interplant transfer program, placement campaigns, retraining). Administrative pitfalls were identified and policy alternatives were explored. Studies sponsored by the committee included the Bradburn Sioux City study, and several by Wilcock and Franke.

Characteristics of Displaced Workers: Generally poorly skilled, older males, high seniority, low education.

Methodology: Cross tabulations and summary reporting of survey data; no regression analysis.

Findings: 2 years after layoff, unemployment rates ranged from 25 to 53%, varying as a function of labor market strength, minority status, skill level, and schooling. Post unemployment wages were about $1.15 to $2.00 per hour compared to an average of $2.65 per hour before layoff. Differences in post-unemployment wages were generally not associated with length of unemployment. Despite an energetic interplant transfer program, relatively few workers transferred, although transfer was often clearly an attractive option. The more senior (higher wage) workers took greater advantage of the transfer option, despite higher severance pay as an alternative.

Consequences of Plant Closure, 1972
James L. Stern

Displacements: 1880 layoffs due to closing of Armour slaughtering and meat processing plant in Kansas City, 1964-65.

Purpose: To measure the economic impact of plant closure on the income of workers exercising different vocational choices, i.e., transfer, training, and market alternatives.

Characteristics of Displaced Workers: Mostly male, unskilled, negro. Average age 42 years, ninth grade education, 13 years of seniority. Workers were relatively disadvantaged for vocational readjustment.

Data: 946 individuals in final sample. Demographic data from Employment Service and company records. Earnings estimates derived from Social Security earnings records.

Methodology: Regressions of 1967 earnings as a function of transfer, training status, 1963 earnings, sex, skill, age, seniority, education, and race. In an effort to compare laid off workers with similar workers not laid off, comparisons are made with weekly wages of all production workers in manufacturing in the Kansas City SMSA.

Findings and Conclusions: Workers electing the interplant transfer option increased their annual earnings by over $2000, but training showed no significant impact. Skilled workers had a $1500 advantage in reemployment earnings. Males, younger and more educated workers also had higher reemployment earnings, other factors held constant. Stern compares earnings for the whole sample which were 20% lower in 1967 than in 1963, with weekly wages for all production workers in manufacturing in Kansas City, which rose 10% during that time. Other plant closing studies are cited for evidence of earnings loss following layoff. It is concluded that government might help workers subject to displacement by facilitating transfer rather than training programs.

Comment: The use of company records matched to both ES and Social Security earnings records provides a useful precedent for additional research.

Stern inappropriately compares his sample evidence on earnings with aggregate statistics on wages.

The large earnings effect found for transfer may be exaggerated by that variable picking up other omitted demographic factors such as ambition, which promote high earnings. Other studies have documented the association between transfer choice and other earnings-promoting factors. Transfer enabled retention of union status and continued use of industry specific training.

The Effects of Unemployment on Engineering Careers, 1972
Paul H. Thompson

Displacements: Arising from cutbacks and layoffs in aerospace-defense industry. An estimated 15% of workers in the industry were displaced 1968-71.

Purpose: To compare characteristics of laid-off and retained engineers, to determine the effects of displacement, and to study the job search process.

Data: Three data bases consisted of information on 1600 employees received from firms, 480 mail questionnaire responses from employees an average of 10 months post layoff, and a telephone survey of job search processes.

Methodology: Most of the analysis consisted of two way cross-tabulations.

Findings: Percents laid off were highest for those with 1-2 years of service, for older engineers, and for those with low performance ratings. The post-layoff survey revealed 20% still unemployed, and 3% not seeking employment. Older engineers and those with high salaries prior to layoff were less frequently reemployed. 14% of respondents found employment not related to engineering. Unemployment duration averaged 6 months for all layoffs.

The Post Layoff Experience of Displaced Carpet-Mill Workers, 1966
N. Arnold Tolles

Displacements: A carpet mill in a small community with high unemployment cut its work force in half between 1960 and 1962, displacing almost 800 workers.

Purpose: To explore the situation of displaced workers in an industry confronted with import competition.

Characteristics of Displaced Workers: Most were over 45, 79% male, low education, exceptionally stable residence.

Data and Methodology: Cross tabulations of post-layoff data and personal and skill characteristics of laid off workers, taken from firm's "reemployment roster." Interviews of 160 former workers averaging 1-$\frac{1}{2}$ years after layoff provided data on post-layoff experiences.

Findings: Although individual experiences varied widely, unfavorable local job market conditions coupled with poor employability characteristics led to large displacement losses. 45% of post-layoff months were spent unemployed as compared with 13% of 12 pre-layoff months. Nearly all reemployed workers changed occupation and about half had two employers following layoff. Average wages were 7% below former mill wages. Women, older workers, and those with relatively less education lost more in earnings and had lower rates of unemployment.